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6-2009

ME-EM eNewsBrief, June 2009

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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Department of Mechanical Engineering—Engineering Mechanics



Greetings from William (Bill) W. Predebon, Chair, Department of Mechanical Engineering-Engineering Mechanics. For the latest news and information about our faculty, students, and staff please visit our web site at <http://www.me.mtu.edu/>.

Upcoming Events

ALUMNI CRUISE:

The Department of Mechanical Engineering - Engineering Mechanics (ME-EM) will again host a boat cruise on the Portage Canal during the Michigan Tech Annual Alumni Reunion. If you are making plans to attend the Reunion on August 6-8, 2009, please set aside Thursday August 6th from 1 - 4 p.m. for this fun event. We promise to have you back in time for the Pasty Picnic. This complimentary cruise is reserved for ME-EM alumni and their families. Refreshments will be served. Please contact us at (906) 487-2551 or kagoulet@mtu.edu to reserve room on the cruise.



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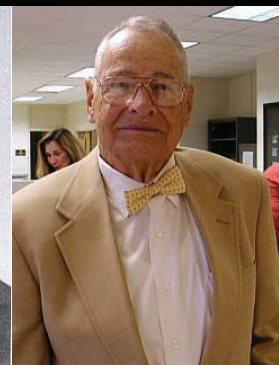
EMERITUS BIRTHDAY:

Please join the Department for a surprise celebration of Professor Emeritus Aubrey Gibson's 90th birthday at the Reunion Pasty Picnic on August 6th, 2009. If you plan to attend please contact us at (906) 487-2551 or kagoulet@mtu.edu.

Professor Gibson



Then



Now

Alumni and Friends News & Accomplishments & Awards

Two ME-EM alumni will be receiving Michigan Tech alumni awards during the August 2009 reunion. John Calder (BSME '67) will receive the 2009 Outstanding Service Alumni Award and Michelle Boven (BSME '99) will receive the Outstanding Young Alumni Award.

Timothy Thomas (BSME '81), CEO of PARTSsolution, has announced entering into a multiyear agreement with Boeing for software and services for their 3D catalog management system.

Dr. Terry Woychowski (BSME '78) had the senior capstone design project his family foundation funded highlighted in Tech Today. The project, an inexpensive, simple, low tech, human powered grain mill that could be made from readily available materials in Africa, won second place in the Michigan Tech Undergraduate Expo held in April. Read the article at: <http://www.admin.mtu.edu/urel/ttoday/previous.php?issue=20090427>.

University News/ Awards



Michigan Governor Jennifer Granholm has appointed Marquette civic leader Thomas L. Baldini to fill a vacant seat on the Board of Control. Baldini will serve through 2016. He replaces David Brule, whose term has expired. He is a graduate of Northern Michigan University with a Bachelor of Science in Secondary Education.

Michigan Tech is realigning programs and support services for a broad range of students to create an outreach and multicultural affairs center. The center will focus on diversity, providing services for all students, including ethnic minorities, women, and lesbian, gay, bisexual and transgender students.

Dr. Timothy Schulz, dean of the College of Engineering, is quoted in the cover story of the summer 2009 issue of PRISM, a magazine published by the American Society for Engineering Education. The story explores the state of Michigan's efforts to build a green economy.

Department Accomplishments

New Department Structure

In May 2009, the faculty of the Department of Mechanical Engineering - Engineering Mechanics by a majority vote permanently included a new research structure into the Department charter after a three year trial period. The new department structure is a matrix structure of research groups along with the traditional technical education areas. The new structure included a Director of Research, Director of Operations and Finance, Research Groups, and a Research Committee. The purpose of the research structure was to better prepare the department to respond to large, collaborative interdisciplinary research requests for proposals. The research groups are based on depart-

ment strengths or emerging areas, current and future funding opportunities and national needs. As a consequence and by design, new research groups emerge and others sunset. The research groups are designed to encourage inter-ME-EM technical area, inter-department, inter-college/school, and inter-university collaboration. Currently there are five research groups. Read more about them at: <http://www.me.mtu.edu/research/index.html>.

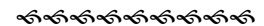


New Course

Michigan Tech was selected by General Motors among the State of Michigan universities to offer a class in Advanced Propulsion for Hybrid and Electric Vehicles to laid-off engineers. The course

included the use of GM's powertrain laboratories as the hands-on laboratory component of the course. Funding for the course was made possible through a trilateral partnership among General Motors, Michigan Tech and the Engineering Society of Detroit. Sixty engineers from their 20's to 50's were selected out of over 200 applicants for the class. Dr. Jeffrey Naber (ME-EM) was the lead faculty member on the team that taught the course. Other faculty members were Dr. Jeffrey Allen and Dr. John Beard (ME-EM), Jeremy Worm (research engineer, ME-EM), Dr. Jeffrey Burl and Dr. Wayne Weaver (Electrical and Computer Engineering), Dr. Stephen Hackney (Materials Science and Engineering), and Dr. Jason Keith (Chemical Engineering). GM also pro-

vided materials for the course. The class was free for the laid-off engineers.



Rankings

The Mechanical Engineering - Engineering Mechanics Department is 3rd in the nation in mechanical engineering degrees awarded for 2007-08 according to ASEE published data.



Mechanical engineering graduate school rankings released by US News & World Report on April 24, 2009 rank the ME-EM graduate program at 48th nationally.



Faculty and Staff Awards and Accomplishments

Faculty promotions:

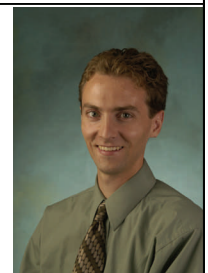
Dr. Jeffrey S. Allen (assistant professor, ME-EM), has been promoted to associate Professor with tenure.



Dr. Roshan M. D'Souza (assistant professor, ME-EM), has been promoted to associate professor with tenure.



Dr. Gregory M. Odegard (assistant professor, ME-EM), has been promoted to associate professor with tenure.



Faculty and Staff Awards and Accomplishments—continued

Dr. Craig R. Friedrich (professor and Associate Chair and Director of Graduate Studies, ME-EM) has been named to the Robbins Chair in Sustainable Design and Manufacturing. The Chair was established by a donation from Richard Robbins (BSME '56 and Hon Doctor of Engineering '96) and his wife Bonnie.

program design, continuing professional education and/or a special project to the University of Malta's various faculties and departments."

Fulbright Scholar. Rao will teach a course on environmental noise pollution for scientists and engineers at the Indian Institute of Science. His research will focus on traffic and industrial noise pollution in Bangalore, India, and he plans to co-organize a workshop on this topic.

currently on assignment at NSF as a Program Director for Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP).

Dr. John K. Gershenson (professor, ME-EM) has been invited to be the U. S. Embassy to Malta's first "Ambassador's Scholar" to serve as an expert consultant on curriculum development,

Dr. Donna J. Michalek (associate professor, ME-EM, and Assistant Provost) has been selected as Faculty Advisor of the Year. Dr. Michalek is the faculty advisor for the Delta Phi Epsilon Sorority.

Dr. Sheryl A. Sorby (professor, ME-EM) has been elected Fellow of the Society for Engineering Education (ASEE) in recognition of her outstanding contributions to engineering education. Dr. Sorby is

John W. Sutherland (Henes Chair Professor of Mechanical Engineering) was selected to receive the 2009 Society of Manufacturing Engineers Education Award. Sutherland was selected for his efforts to develop manufacturing curricula and inspire students to enter the profession of manufacturing.

Current Contracts and Grants

Abdelkhalik, Ossama (PI, ME-EM), "Estimation of Relative Positions and Attitudes of Microsatellites Constellations Using Wireless Local Positioning System", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$14,792.

of Stress Concentration in Artificial Heart Using Finite Element Analysis", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$2,500.

King, L. Brad (PI, ME-EM), "Metal Nanotip Formation in Zero Gravity Re-Flight", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$2,500.

Malti, Spandan (PI, ME-EM), "Biomimetic Design of Low Density Foams Subjected to Thermal and Mechanical Shock", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$18,835.

Chen, Bo (PI, ME-EM), and **Abdelkhalik, Ossama** (Co-PI, ME-EM), "Initial Analysis for a Semi-Active Vibration Damping System for Spacecraft in Launch Vehicle", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$15,600.

King, L. Brad (PI, ME-EM), "High Altitude Autonomous Research Platform", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$2,500.

Komaravolu, VC Rao (PI, ME-EM) "1Q PACE/ 3Dconnexion", sponsor: PACE, total award: fifteen 3Dconnexion SpacePilot computers.

Odegard, Gregory (PI, ME-EM), "Multiscale Modeling of Failure and Damage of Thermosetting Polymer Networks", sponsor: US Department of Defense - Air Force Office of Scientific Research, total award: \$195,000.

Haut Donahue, Tammy (PI, ME-EM), "Parametric Study

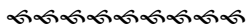
King, L. Brad (PI, ME-EM), "A Nanosatellite Calibration Target for Attitude and Shape Recognition Models", sponsor: US Department of Defense - Air Force Office of Scientific Research, total award: \$134,958.

Lee, Seong-Young (PI, ME-EM), "Investigation of Enhancement of Deflagration-to-Detonation Transition Processes Using an Atmospheric RF Plasma in a Detonation Tube", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$19,968.

Parker, Gordon (PI, ME-EM), "Development of a Ship-Launched Aerial Delivery System", sponsor: Craft Engineering, total award: \$159,101.

Current Contracts and Grants—continued

Rao, Mohan, (PI, ME-EM), "Design and Validation of a Cart/Rail System for the Calibration of an Acoustic Doppler Current Profiler", sponsor: South Florida Water Management District, total award: \$44,730.



Shahbazian Yassar, Reza (PI, ME-EM), "Mechanics of Hydrogen Storage in Nanostructured Materials", sponsor: University of Michigan - Michigan Space Grant Consortium, total award: \$15,000.

The following faculty members have been awarded Michigan Tech Research Excellence Fund Awards:

- **Dr. Craig Friedrich (PI, ME-EM and MUSTI), Dr. Jeffrey Allen and Dr. Chang Kyoung Chol (co-PIs, ME-EM)** "Total Internal Reflection Fluorescence Microscopy Imaging nanoparticles, Biomaterials, and Bio-Nano Hybrid Materials", Infrastructure Enhancement award, total award: \$15,000.
- **Dr. Bo Chen (PI, ME-EM),** "Immune-inspired Design Methodology for Building Autonomous Structural Health Monitoring Systems", Research Seed award, total award: \$9,500.
- **Seong-Young Lee (PI, ME-EM),** "Investigation of Direct Injection Flash Boiling Spray in a Combustion Vessel", Research Seed award, total award: \$5,500.
- **Dr. Scott Miers (PI, ME-EM and APSRC),** "Development of a Novel Nucleate Boiling Identification Technique to Optimize Internal Combustion Engine Thermal Management", Research Seed award, total award: \$7,000.
- **Dr. Abhijit Mukherjee (PI, ME-EM),** "Experimental Investigation of Biomimetic Water Management in a Proton Exchange Membrane Fuel Cell", Research Seed award, total award: \$15,000.

Faculty and Student Invention Disclosures

Kevin Bence, Jason Hammel, Andrew Jaworski, Ryan Sullivan, and Kevin Temple (ME seniors) have filed an invention disclosure, "Next generation tractor trailer interface." Senior design project advisor: Michael LaCourt (research engineer/scientist, ME-EM).

Christopher Cooper, Alexandre Gagne, Myles Metzler, Tyler Schoenherr, Samuel Tootle, and Christopher VanDyke (ME seniors) have filed an invention disclosure: "Automated Vision Maintenance System". Senior design project advisor: Dr. William Endres (associate professor, ME-EM).

Jeffrey Decker, Daniel Jacobson, Benjamin Jensen, Evan Lloyd, Nicholas Peot, and Ryan Pulkrebek (ME seniors) have filed an invention disclosure for "Sealing Contact Pressure Measurement". Senior design project advisor: Prof. Charles Van Karsen (associate professor, ME-EM).

William Ferenc, Christopher Hutton, Steven Kussmaul, Christian Riedel, and James Thunes have filed an invention disclosure (ME seniors), "Multi-axis head design". Senior design project advisor: Dr. William Endres.

Dr. Gopal Jayaraman (professor, ME-EM) has filed an invention disclosure for "Powered Snow Removal Brush."

Student Competitions and Team Awards



The Michigan Tech Aerospace Enterprise team placed third in the US Air Force's University Nanosat-5 Program and is featured in Resource Guide 2009, a computer

industry trade magazine. The article, "PC/104 Powers Nanosatellite for Space Situational Awareness," details how the team used PC/104 technology to give their nanosatellite Oculus the power to maneuver and avoid collisions in orbit. Read the article at: <http://www.smallformfactors.com/articles/id/?3855>.



For the first time Michigan Tech's **Blizzard Baja Enterprise** earned the most points from the three SAE Baja competitions this spring, taking home the Mike Schmidt Memorial Iron Team Award. Their results were: eighth overall at the Baja SAE Alabama held on April 16th - 19th, 2009 at

Auburn University in Opelika, AL (3rd in endurance, 10th in design, 12th in acceleration, 13th in suspension & traction, and 13th in cost); second overall at the Baja SAE Oregon held on May 7-10, 2009 in Portland OR (3rd in endurance, 7th in hill climb, 8th in sales presentation, 11th in design and 12th in rock crawl); sixth overall and a Sportsman Award at the Baja SAE Wisconsin held on June 11-14, 2009 at the University of Wisconsin in Burlington, WI (1st in suspension & traction, 7th in mud bog, 8th in endurance and 8th in maneuverability).

Student Competitions and Team Awards—continued



ME-EM teams place in the 2009 Michigan Tech Undergraduate Expo held on April 16th:

- **Senior Design 2nd place - Human Powered Grain Processor.** Team members: **Tyler Blank, Eric Boeckers, Caleb Colyer, Nathan Fetting, Kate Olkkonen, Richard Winter.** Sponsor: Woychowski Family Charitable Foundation. Advisor: Dr. John Beard (associate professor, ME-EM).
- **Senior Design 3rd place - Off-road Trail Assist Vehicle.** Team members: **Colln Fay, Eric Jacobsen, Derrick Metz, Mindy Miller, James Peltzmeier, and Craig Slattey.** Sponsor: Michigan Parks and Recreation Association's Access to Recreation initiative and Tech's Department of Sports and Recreation. Advisor: Dr. John Beard (associate professor, ME-EM).
- **Senior Design Honorable Mention - Dryer Support roller Design Harmonization.** Team members: **Keegan Burggren, Jamle Dufner, Robert Hambrock, Travis Jansen, Colln Neese, Steven Worster.** Sponsor: Whirlpool Corporation. Advisor: Prof. Charles Van Karsen (associate professor, ME-EM).



ME-EM Senior Design Team 1 (3rd place above) had their senior design project highlighted in the Daily Mining Gazette. The project is a tracked wheelchair that allows handicapped people to get out onto trails and woods where they might not normally be able to venture. The wheelchair is very stable and creeps along slowly. It is also quiet and makes for a very enjoyable experience. They also worked on two more projects connected with the wheelchair: a platform that a wheelchair can be rolled up on and then driven away via battery power, and a hand-operated wheelchair, giving yet another mobility option for the handicapped. See [the wheelchair in action](http://www.youtube.com/watch?v=sxCl2t_pcS0) at: http://www.youtube.com/watch?v=sxCl2t_pcS0



Michigan Tech's SAE Supercar team placed third in the SAE Supercar Competition at the Eaton Corporation Marshall Proving Grounds in lower Michigan with 1, 140 miles per gallon.

Student Accomplishments and Awards

The following MEEM students received Michigan Tech Endurance Sports Awards:

- **Kenneth Gilkerson** (senior) - Most Valuable Athlete for the track and field team, the Most Improved Runner for cross country, and the Scholastic Achievement award winner for both cross country and track and field.
- **Sarah Gray** (senior) - Most Improved in women's cross country

The following MEEM students received awards at the Michigan Tech 15th Annual Student Awards Banquet:

- **Joseph Gallom** (junior) - Exceptional Enthusiasm as a Student Leader Award
- **Rel Tangko** (senior) - Vice President for Student Affairs' Award for Service

Rebecca Franke (senior) has been awarded a University Women's Connection (UWC) scholarship for 2009.



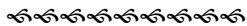
The following ME-EM students have been named to the GLIAC all-academic team:

- **Joshph Anhalt** (senior) - Men's Track and Field
- **Kenneth Wilkerson** (senior) - Men's Track and Field
- **Aaron Tetzloff** (senior) - Men's Track and Field
- **Timothy Viola** (senior) - Men's Tennis

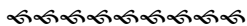


Student Accomplishments and Awards - continued

Jeffrey Katalenich (senior) has been awarded a National Defense Science and Engineering Graduate Fellowship. He was selected from over 2,000 applications. The fellowship covers full tuition and required fees for three years as well as a yearly stipend of over \$30,000 per year. Jeff has also been awarded a three year National Science Foundation Graduate Research Fellowship for \$30,000 per year. He will be allowed to spread the fellowships over a 5 year period.

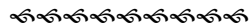


Megan Killian (Biomedical Engineering PhD candidate) has been awarded a \$500 Biotechnology Research Center Travel Grant toward her poster presentation at the ASME Summer Bioengineering Conference that was held in Marco Island, Fla., in June. Advisor: Dr. Tammy Haut-Donahue (associate professor, ME-EM).

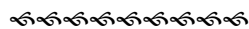


Nate Kroodsma (ME-EM PhD candidate) has received honorable mention

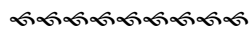
for the NSF Graduate Research Fellowship Program. Advisor: Dr. De-sheng Meng (assistant professor, ME-EM).



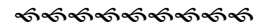
Anahita Pakzad (ME-EM PhD candidate) received a travel grant from the Biotechnology Research Center toward her podium presentation at the TMS 2009 Annual Meeting, held in San Francisco in February. Advisor: Dr. Reza Shahbazian Yassar (assistant professor, ME-EM).



Pavan Valavala (ME-EM PhD student) Summer Graduate School Finishing Fellowship. Advisor: Dr. Gregory M. Odegard (associate professor, ME-EM).



Kelth White (BSME '09) was named the Raymond L Smith Award winner as the University's outstanding male student-athlete of the year.



The following ME-EM undergraduate students were awarded Michigan Tech's Summer Undergraduate Research Fellowship (SURF) awards from the Vice President for Research and the Honors Institute. Funding decisions were made based on a review of students' applications by faculty members across campus.

- **Daniel Dublel**, "Parametric Study of Stress Concentration in Artificial Heart using Finite Element Analysis," his advisor is Dr. Tammy Haut Donahue (associate professor, ME-EM).
- **Gareth Johnson**, "Development of Self-Diagnosing Adaptive Structures for Composite Materials," his advisor is Dr. Keat Ghee Ong (assistant professor, Biomedical Engineering)
- **Andrew Ramsey**, "Design and Manufacture of a Model Gas Turbine Compressor," his advisor is Dr. Seong-Young Lee (assistant professor, ME-EM).

